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COMPOST ONTARIO

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OCT 26 1998

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HOME COMPOSTING HANDBOOK

How to Promote Home Composting in Your Community

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COMPOST ONTARIO

October 1990

Dear Friend:

We hope that this Handbook is helpful to you as you work to promote home composting in your community. The Handbook has six sections. The first four sections outline four different projects you can undertake to promote home composting. The fifth section provides information about possible sources of funding for your projects. And the sixth section, the Appendices, provides some background information.

Just a few years ago home composting was practiced by a relatively few keen gardeners and environmentalists. Today thousands of people in Ontario are showing an interest in composting as part of their desire to be good environmental citizens. Composting is not difficult, but it is unfamiliar to many people. Clear, concise, and accurate information about how to compost, combined with an opportunity for people to get answers to their questions and concerns, will help people become confident and successful in their composting efforts.

We welcome your feedback on the Handbook, and would love to hear about the projects you undertake.

This Handbook has been produced as part of COMPOST ONTARIO, a project run by the Recycling Council of Ontario with funding from Barclay Recycling Inc. and the Ontario Ministry of the Environment.

Happy Composting!

Judy Vellend

Judy Vellend
Coordinator
COMPOST ONTARIO

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HOW TO RUN A PUBLIC WORKSHOP ON HOME COMPOSTING

A public workshop on home composting is an effective way to educate people about how to compost and to give them an opportunity to raise their questions and concerns. Here are some tips on how to run a good workshop.

GETTING READY

Invite a Speaker

If you are involved in planning the workshop, but will not be making the presentation yourself, here are some ideas for possible speakers:

- a Master Composter, if there is a Master Composter Volunteer Program in your community
- municipal staff involved in running home composting programs in your municipality; call your Recycling Coordinator or Public Works Dept.
- a Master Gardener or member of the Canadian Organic Growers Assoc.
- a local resident with composting experience
(A list of contacts for speakers is attached.)

Book a Room

- Book a room well in advance; six weeks to three months lead-time may be needed.
- Choose a location with good public transit access and parking.
- Book a room that is the appropriate size for your audience, although this may be difficult to anticipate. If the room is large and the turnout small, ask people to come to the front.
- A free or low-cost room may be available at:
 - schools or boards of education (a permit may be needed)
 - community centres (inquire through your Parks & Recreation Department)
 - city hall (the recycling coordinator or a municipal councillor may give you a hand)

Arrange A/V

- If you will be using A/V equipment, plan ahead to bring your own or to rent.
- Depending on your program, you might need:
 - a slide projector and screen
 - an overhead projector
 - a microphone and public address system, i.e. amplifier and speakers
 - a small light for reading a script while showing slides or

overheads

- Be prepared and take extra projector bulbs and extension cords.

Advertise

Let the residents of your community know about the workshop. Here are a few ways to advertise:

- press releases (these may lead to interviews)
- newspaper ads (dailies and community newspapers)
- Public Service Announcements for radio and Cable TV
- flyers in libraries (see sample attached)
- 'municipal councillors' newsletters
- piggy-back with literature distributed as part of a municipality's bin distribution program

ON THE BIG DAY

Be Prepared

Come at least 60 minutes beforehand to check the A/V equipment, set up displays, and get some water to have at hand while making your presentation. Leave extra time if you have to set up the chairs.

Bring with you a grab bag of miscellaneous supplies that might prove handy: masking tape (to tape down cables and tape up signs), marking pens, scrap paper and scissors.

Your Presentation

What you actually do for your presentation will depend on how knowledgeable you are about composting, and how much experience you have making presentations. If this is all pretty new to you, you may wish to take advantage of the "Home Composting Slide Show" produced by the Recycling Council of Ontario as part of COMPOST ONTARIO. If so, your evening might look something like this:

As people arrive, hand each one a questionnaire that they will fill out at the end of the evening to evaluate the workshop. (Alternatively, you can place the questionnaires on the seats before people arrive.)

15 min. Welcome everyone. Introduce yourself, your co-workers, and any guests. Talk a bit about the organization you represent and its programs. You can ask for a show of hands to get an idea of how many people are already composting.

30 min. Make the slide presentation.

- 30 min. Take questions from the audience. You might decide in advance to invite someone to help you answer questions, for example another person with whom you work, or a local gardening or composting 'expert'. If you cannot answer a question, be frank and don't panic. You can:
- see if a member of the audience can help out
 - offer to look into it at a later time
- 5 min. Thank everyone for coming.
- 15 min. Allow time for looking at the displays and chatting informally.

If you're quite comfortable making presentations, you might prefer not to use the slide show. If so, aim for an informal style using your own words rather than reading from notes. You can use overheads to give some visual focus to each topic you're discussing.

Involve the audience whenever you can. Provide them with the opportunity to share their own experience and raise their concerns. And bring lots of 'hands-on' samples. You can try the following:

- When you're talking about storing kitchen scraps by the sink, show one or two samples of containers, and have them filled with scraps.
- When you're talking about what materials you can compost, instead of simply reading a list to the audience, pose the question to them and let them help answer it.
- When you're talking about how to compost, use a demonstration compost bin (you can make a simple box of wood with one plexiglass side, and sized to sit on a table top). Add layers of kitchen scraps, yard waste and soil, and sprinkle with a watering can.
- When you talk about the uses of finished compost, hand around some samples for people to have a close look at.

Content

Whatever your approach, make sure you cover these basics:

- what composting is
- its advantages
- materials you can and cannot compost
- how to compost (Emphasize that you can do as little or as much work as you wish. Chopping, watering and aerating will speed up the process but are not essential.)
- what to do about pests and odours
- harvesting and using finished compost
- various containers that can be used (If there is a bin distribution program in your community, people will be most interested in knowing how to use those bins. Also acknowledge

that some commercial bins come with instructions that may vary from the standard instructions, for example regarding adding meat.)

Establish Rapport With Your Audience

- encourage audience input: people learn better when they're involved, and some members of the audience may have a wealth of composting experience to share
- avoid the 'expert trap': if you set yourself up as an expert, people may feel that only people like you can do composting, or they may enjoy challenging you just for the sake of it
- have an open, friendly, relaxed manner: by fostering an atmosphere of mutual respect, you will be better able to realize your goal, which is to communicate with your audience
- be a good listener by giving people your complete attention and asking questions where necessary to be sure you're clear about what the person is saying

Tips on Making a Great Presentation

- be positive: emphasize the ease and advantages of composting
- have your content well organized; be clear and concise, and avoid overloading your audience with too much information; identify ahead of time the few main points you want people to go away with
- make your presentation relevant; be clear about what it is your audience wants and needs to know; a simple hand survey at the beginning may be helpful
- develop a delivery style that's right for you; be yourself
- speak slowly and clearly
- introduce variety by using Questions & Answers, audio-visual presentations etc.
- avoid lecturing too long; 20-30 minutes is the limit of most people's attention span
- leave lots of time for questions

Displays

Have items on display for viewing before and after the workshop. Consider these:

- books on composting (see "Home Composting Bibliography")
- composting bins (companies may be prepared to supply you with bins at no cost; if your municipality is distributing bins, it would certainly make sense to have these bins on display, especially if there is a choice)
- samples of materials to compost: leaves, grass clippings, fruit and vegetable scraps, plant remains, sawdust etc. (these can be displayed in small, clear plastic containers or in a special container you construct; you can make a display box from wood, divide it into sections, and cover it

- with plexiglass; don't forget to label the materials)
- a sample of finished compost
 - aerating tools
 - a screen (to sift finished compost)
 - a mobile display (see "Portable Display Plans")
 - a worm composting bin

Have how-to-compost fact sheets available in quantity for people to pick up.

EVALUATION AND FOLLOW-UP

To judge how effective your workshop has been, you can ask each member of the audience to fill out a questionnaire (see "Workshop Evaluation Questionnaire" at end). A follow-up telephone survey will give you additional information.

A COMPOSTING HOTLINE

Once the workshop is over, it's important that people who have further questions have someplace to turn. Consider setting up a composting hotline. It can be staffed by the municipality, an environmental organization, or a gardening group. If your resources are limited, you can restrict the number of hours that the hotline is open.

AUDIENCE

This guide has focused on workshops organized for and advertised to the public at large. Presentations can also be made to :

- church groups
- ratepayers' associations
- women's groups
- service groups
- cottagers' associations
- gardening groups
- youth groups
- professional associations
- large corporations
- students at the elementary, secondary and post-secondary levels
- workers at their place of employment

GOOD LUCK!

MASTER COMPOSTER VOLUNTEER PROGRAM

COMMON COMPOSTING QUESTIONS AND ANSWERS

General Questions

1. Why compost? How long does it take? When is it done? Can it be done in winter?
2. Siting and sizing compost bins.
3. Finished compost: Uses, qualities and quantities.

Composting Problems

4. Odours, rodents, insects.
5. Pathogens and toxins: Pet wastes, coated paper, fireplace and BBQ ash, sewage sludge, pesticides, plywood sawdust.
6. Pests: Weeds and diseased plants in compost.

Essentials

7. Carbon-to-nitrogen ratios: Composting and mulching with woody wastes
8. Moisture in compost: Watering, covering.
9. Turning, chopping and shredding.
10. Additives: Lime, soil, bioactivators, fertilizer.

Food and "special" wastes

11. "Special" yard wastes: Grass clippings, waxy evergreen leaves, oak leaves.
12. Food waste composting: Worm bins, coffee and tea, animal products.

General Questions

1. Why compost? How long does it take? How do you tell when it is "finished"? Can it be done in winter?

Why should I compost?

Organic materials are a valuable resource when composted or used as mulches in the garden. Organic material improves soil and plant health, prevents erosion and holds moisture and nutrients in the soil. When dumped in a landfill, decaying organic materials create explosive methane gas and acids which react with other materials and create toxic leachate which may contaminate groundwater. Backyard composting is less expensive and more efficient than sending wastes to the landfill, incinerator or even to centralized composting facilities. In fact, composting enables householders to reduce their garbage by 1/3 to 1/2. And the finished compost is free.

How long does it take to get finished compost?

Yard waste composted in a holding unit may take from three months to two years to decompose (longer for large, unchipped branches), depending on the composition of the materials being composted, how they are prepared, and if the compost is turned or aerated occasionally. If wastes are carefully combined to balance Nitrogen and Carbon, chopped, moistened and turned, compost can be made in as little as three weeks.

How do I know when the compost is "finished" and ready to use?

Compost is ready to use when most of the original plant materials are no longer recognizable (some tough woody materials may be present - these may be sifted out and returned to the compost pile). Finished compost is dark-coloured, sweet-smelling, crumbly and looks and feels like soil.

Can I compost in winter?

The compost process generates heat. Cold weather will not destroy your compost; it just slows it down. You can continue to add material to your heap throughout the winter, even if the heap freezes. In the spring it will thaw, and the decomposition will speed up again.

You can insulate your compost pile by covering the heap with thick, dark plastic sheeting and thick layers of leaves, hay or straw. "Anaerobic" decomposition (i.e. without oxygen) will take over this kind of insulated pile. This will not prevent freezing (unless your heap is very large), but will certainly delay it.

Worm composting is especially useful for winter composting. You can set up a portable worm bin that is brought indoors once the cold weather starts. Or you can make a specially-designed insulated bin for worm composting outdoors all year round.

2. Bins: Siting and sizing

Do I need a bin to make compost?

No. Compost can be made in free-standing open piles. However, bins help keep piles neat and free from disturbance by pests and are a good idea when composting in urban areas.

How large an area do you need to compost?

This depends on how large a yard you have, how intensively it is gardened and how many people are being fed from the household. Generally, one or two 3'x 3' bins are adequate for the average city household. A 2'x 4' by 1' deep worm bin is adequate for two or three people's kitchen scraps.

Where is the best place to put a compost pile?

Choose a spot where there is good water drainage. If you have your compost pile in a sunny spot, it will stay warm and decompose quickly, but it may dry out faster (so a sunny spot is preferable if your composting spot has poor drainage). In the shade there is less chance of drying out, but since the pile won't collect as much heat from the sun the decomposition will go a little more slowly. A cover over the pile will help you to control the moisture level. The ideal is to have your compost as moist as a squeezed-out sponge.

3. Finished compost: Uses, qualities and quantities

Do I need to add fertilizer to my garden if I use compost?

Yes. Compost is a soil conditioner, not a reliable source of major plant nutrients (Nitrogen, Phosphorus, Potassium). Compost helps to improve soil drainage and moisture retention, holds nutrients from fertilization in the soil for gradual use by plants, neutralizes acid soils and adds small amounts of minerals needed for plant growth.

Can I compost all of my yard wastes? Will I have too much compost?

Nature recycles all of its organic wastes through mulching: you should be able to use all of your organic wastes too. Composting is a waste reduction process in which organic material is constantly being broken down into finer, more compact forms, and being transformed into energy for plant growth and food to build leaves, stems and fruits. If you have a yard, then you have a place to use finished compost. Most gardeners import compost to their gardens, as well as using their own yard waste compost.

What can I do with grass clippings if I don't have a "garden"?

Grass clippings, composted or not composted, make an excellent mulch around shrubs, trees and potted plants. Several inches of mulch may be added to these plantings each year. For trees planted in lawns, remove sod around the tree in a circle 3' or more in diameter to create an area for annual mulching. Finished compost may also be screened and spread on lawns. There is always a use for compost.

Also, re-consider using a lot of fertilizer on your grass. Why use chemicals to force your grass to grow faster than it would naturally? It only means you have to mow more often! Let grass grow naturally and nourish it with its own cuttings. Set the height on your lawnmower blade to cut short and leave the cuttings right on the grass.

How does compost affect the acidity (pH) of soils?

Most yard waste composts are neutral to slightly acidic. Humus acts as a buffer in the soil. Plants are less dependent upon a specific soil pH when there is an abundant supply of humus.

What are the storage needs for compost from the average yard?

The amount of compost generated in a yard depends on the size of the yard, what is being grown there, how it is being composted and other factors. Finished compost occupies only about 30 to 40% of the volume of raw wastes. Composted leaves can be as little as 10% of the volume of the original waste. Storage is usually not a problem. For small yards, a holding unit should handle all of the wastes generated. Larger yards and intensive gardens may require more than one holding unit, or a turning system.

Is it OK to garden in pure compost? In compost mixed with fill soil?

It is best to mix compost with mineral soils (clay loam, sandy loam) for gardening to have ideal texture and provide anchorage for plant roots. Clean fill soil (not pure clay!) and compost mixed in roughly equal amounts should provide a good growing medium. Plants do not root well in pure compost.

Composting Problems

4. Odours, rodents, insects.

What can be done about a smelly compost pile?

Smelly piles are most often caused by too much water and poor aeration or putrefying animal products. Any of these situations can result in anaerobic conditions, meaning that there is a lack of oxygen in the pile. The bacteria that live in such anaerobic piles produce a sulfuric, "rotten egg" smell. Smelly piles should be turned to introduce air and encourage "aerobic" bacteria. Wet, compacted materials should be broken up with a pitch fork, and coarse materials (dry organics such as leaves, straw or corn stalks) may be mixed in to absorb excess moisture and create air spaces.

Are rats attracted to compost? How can I get rid of them?

In Toronto, rats are not a common problem for composters. If you are extremely concerned about the possibility of attracting rats, or if for some reason you already have a rodent problem, then you must rat-proof your compost heap. Your goal is to prevent any rodent from tunnelling up through the bottom of your heap, or climbing into it through the sides or top of your bin.

1. Sturdy 1/2-inch metal mesh will exclude rats. Chicken wire is considered too weak, but 1/2-inch mesh "hardware cloth" or "1/2 x 1/2 mesh" or a plastic-coated 1/2 x 1/2 mesh called "aquamesh" are all strong and durable. Mesh is galvanized to prevent rusting; the lower the gage number the stronger the mesh. Modify your present bin by lining the sides and bottom with metal mesh. If you are making a new bin, you can use the mesh to build the actual structure itself, or again, use it as a liner.
2. A tight-fitting lid is necessary. It should be secured at one side with hinges, and at the other with a latch.
3. Do not add meat, fish, fat, or dairy scraps to your compost pile. When adding other kinds of food scraps to your pile, dig them deeply into the current compost, or cover them completely with soil.
4. Take measures to build a fast-acting "hot" compost heap. A very hot heap can discourage rats, as can turning or otherwise disturbing the pile.
5. Try composting indoors with worms. It isn't messy or odorous, produces compost very rapidly, and handles substantial quantities of food waste (1 lb. of worms digest 1 lb. of waste per day).

Are rats really a problem (if I have cats around to catch them)? Rats pose severe public health problems, carrying disease organisms that can be transmitted to pets as well as to humans. Rats should be discouraged through proper composting techniques, regardless of whether they are obviously present, or are "controlled" by cats.

Do compost piles attract slugs?

Slugs live happily in compost piles and help to break down organic wastes. Often they are so happy there that they don't bother garden plants. However, compost piles can provide daytime hiding places for slugs who may graze in gardens at night. Place compost piles in areas away from vegetable gardens or create barriers (traps, metal flashing...) around the pile to contain slugs.

How can I stop flies and other insects from becoming pests around the compost pile?

Flies are attracted to food scraps and animal manures. To discourage flies dig in food waste each time you add to your heap, or cover scraps completely with soil, dead leaves, or straw. Compost piles made entirely from yard wastes do not usually attract flies or other flying insect pests in large numbers.

5. Pathogens and toxins: Pet wastes, coated paper, wood ash, sewage sludge...

Can yard wastes treated with chemical pesticides and herbicides be put in the compost? What happens to them in the compost pile? There are no simple, clear answers to this question. Individual chemicals react in different ways and break down under unique conditions. Decomposition of most pesticides and their byproducts have not been studied thoroughly. Often the byproducts are more toxic than the original chemicals. Some fungicides contain heavy metals which can build up in your soil.

You should never purposely dump any chemical into a compost pile. At a minimum, thoroughly compost yard wastes that have been treated with pesticides (or chemicals of uncertain origin) in a hot pile and leave to cure for a full year.

I used Killex on my sod last fall. Is it OK to compost it now? (spring)

Killex is one of the most toxic herbicides. It might kill the microorganisms in the pile. It would be best to compost the sod separately.
(Mary Perlmutter)

Can grass clippings treated or suspected of having been treated with a herbicide be composted or mulched safely?
Lawn clippings with herbicides on them may kill garden plants if used as a mulch or a "young" compost. If herbicide use is suspected, materials should be thoroughly composted and allowed to cure for several months before using in the garden. Do not use compost made from wastes of unknown origin on food crops.

Can vacuum cleaner dust be composted?

Natural fibres from wool and cotton rugs will decompose, and are fine to put into your compost heap. Fibres from synthetic carpeting will not decompose, so although the fibres will probably not be noticeable in the finished compost, vacuum cleaner dust (or dryer lint) that contains synthetic fibres would be best left out of the compost heap. Synthetics take many, many years to breakdown, and you would be accumulating them on whatever place you would use your finished compost. It is not known how, or whether, the addition of synthetic fibres to soil affects soil life.

Can I compost plywood sawdust?

To be on the safe side, no. Glues in the plywood may be inorganic and, therefore, will not decompose. In addition, the plywood may contain chemicals to protect the wood from insects. These would be harmful to the organisms in the pile.
(Paul Taylor)

Should I wear gloves when handling compost?

Gloves are not necessary for handling compost, though you may prefer to wear them.

Can glossy magazines, colour inserts and coloured pages from newspapers be composted?

Some glossy papers contain toxic pigments, so these materials should not be composted. Coloured newsprint is safe to compost. There are better ways of dealing with paper products than composting however. Recycle your newspapers in your community's newspaper recycling program. Magazines and discarded letter paper (also called "fine paper") can be recycled through your office, church, or community fine paper recycling program. If your community doesn't have the program you need, start one yourself! Or, go after your elected government representatives until you get a suitable program installed in your community.

Can fireplace ash be used in the compost?

Wood ash may safely be added to compost piles in thin layers. Wood ash is an excellent source of Potassium, one of the major nutrients required for healthy plant growth. Do not burn wood or use ashes from wood treated with paints or wood preservatives. Avoid using ashes derived from the burning of large amounts of paper, as these ashes may contain residues of heavy metal or chlorinated compounds.

Is it OK to compost BBQ ashes?

It is safest not to.

If it's straight charcoal, which is partially burned wood, it's OK. Briquettes, however, likely have chemicals in them which may be a problem.

(Mary Perlmutter)

Can pet wastes be added to home compost?

Pet wastes (dog, cat, or any carnivore) should be buried in an ornamental garden area (not a vegetable garden). Pet wastes from certain herbivores (rabbits, guinea pigs) are not toxic to humans and are safe to compost in the usual way. Rabbit manure in fact makes excellent compost.

6. Weeds and diseased plants in compost.

Can any diseased plant be composted safely?

No diseased plant should be added to a home composting system. Disease organisms may live through the composting process and spread through the garden as compost is used. Large scale composting systems may attain temperatures high enough to kill diseases, but home composting systems do not reliably reach this high - 160 degrees F.

Can weeds be composted? How do you stop them from spreading in compost?

Weeds which have not gone to seed may be composted. Do not compost weeds that have gone to seed, as many seeds survive temperatures up to 140 degrees F., and even a well made "hot" home compost pile may not achieve this heat uniformly. Weeds that spread through roots or runners, such as crab grass and buttercup, or ivy should not be put into compost piles fresh, even if they are shredded. These plants can be spread on pavement to dry thoroughly before being added to compost, or you can recycle them through your local municipal composting system, where they will be composted in hot piles.

Essentials

7. Carbon-to-Nitrogen Ratios

How do you know when you have the proper carbon-to-nitrogen ratio (C:N) for fast composting?

Experimentation is the best way to get a good sense of carbon-to-nitrogen ratios in different materials. Mixing roughly equal volumes of fresh "green stuff" (grass clippings, fresh weeds, flowers, kitchen wastes) and dried "brown stuff" (straw, corn stalks, leaves, dead plants) should provide a good C:N balance. Soil texts and books about composting have tables with some rough figures. Remember 25:1 - 30:1 is an ideal ratio which yields a quick, hot compost. Higher C:N ratios (eg. 60:1) will produce good compost, only it will take a little longer.

Can wood chips be used in compost?

Wood chips may be added in limited quantities. They are very high in carbon, and their limited surface area prevents bacteria from decomposing them quickly. They won't break down completely for a long time, but will improve drainage and aeration in heavy clay soils. A better use of wood chips is as a mulch.

Can sawdust and wood shavings be used in compost?

Sawdust and wood shavings are very rich in carbon, and have more surface area for bacteria to work on than chips do, so these materials tend to "rob" more nitrogen from the soil or compost initially. Sawdust should be aged or weathered before adding it to the compost pile. To balance the nitrogen demands of one cubic yard of fresh sawdust, add 3 1/2 pounds of actual nitrogen (17 lbs ammonium sulphate, 15 lbs blood meal, 11 lbs ammonium nitrate, or 8 lbs urea).

Will mulching with wood chips or sawdust rob nitrogen from plants?

Carbon-rich woody wastes will not compete with plants for nitrogen if they are placed on the soil surface around plants. However, these wastes should not be mixed into the soil without adding nitrogen fertilizer. For this reason, it is best to use woody wastes only to mulch shrubs and trees, where the soil is not tilled and the "mulch" will stay on the surface. If you use sawdust in annual planting areas, add nitrogen fertilizer when turning it under. See the previous answer's recommendation for additions of nitrogen required to balance sawdust. Actual nitrogen "demand" of woody wastes depends on the size of materials. Smaller particles (sawdust) have more surface area for bacteria to work on, so they demand more nitrogen than larger particles such as wood chips.

How can wood/bark chips be made to compost faster?

Rechipping to open more surface area, and adding nitrogen will speed up decomposition of wood chips.

8. Moisture in compost: Watering, covering.

How do you gauge the proper moisture content for composting? Materials should feel like a wrung-out sponge; moist to the touch, but when squeezed in your hand no more than a drop or two of water should come out. Some very dry materials (straw, cardboard and others) may need prolonged soaking and mixing to reach adequate moisture levels.

Do I need to water my compost pile?

Providing adequate moisture is essential for quick composting, but if you are patient you can leave watering to nature. Untended, unwatered compost piles may take six months to two years to decompose. Occasional watering during the dry seasons will greatly speed up decomposition.

Should compost piles be covered?

A compost pile that has good moisture content to start with will benefit from coverage. Covering piles helps to keep them moist during hot weather and prevents them from getting too soggy and having nutrients leach out in rainy weather. However, if a pile is too dry or soggy to start with, covering may make the problem worse..

9. Turning, chopping and shredding.

Do compost "tumblers" work?

Compost tumblers or "barrel turning units" work very efficiently if wastes are chopped, moistened and contain adequate nitrogen. Tumblers with flat sides or internal baffles (like a clothes dryer) are recommended as they mix and aerate materials better than those with smooth sides. These units can produce compost very quickly, as one can turn the barrel every time one makes a deposit of organic material. Since these units are not in contact with the ground, it is a good idea to add a trowel-full of soil at each deposit, as this will introduce valuable soil organisms to the compost.

Do I need to use a shredder to make good compost?

Shredders are useful for creating mulch out of woody materials such as branches over 1/2" diameter and large volumes of shrub prunings. Shredders are also useful to prepare corn stalks and other woody vegetable wastes for quick composting. These wastes may also be broken up by chopping them with a machete or shovel, or by running them over with a rotary lawn mower. Shredding breaks wastes into smaller bits, thereby creating more exposed area for composting bacteria to get into.

How can I shred autumn leaves?

Leaves can be run over repeatedly with a lawn mower. Alternately, put leaves in a garbage can, then use a lawn trimming tool ("whipper snipper") placed in the centre of the leaves to shred them.

What tools can be used to chip woody wastes?

Machete - Green or woody vegetable stalks, prunings up to 1/2" diameter

Lawn mower - Leaves, stalks and twigs up to 1/2" diameter

"Whipper snipper" - leaves

Electric chipper - Leaves, stalks and twigs up to 1" diameter

3-5 H.P. Gas Shredder - Twigs and branches up to 2 1/2" diameter

Commercial shredder (8+ H.P.) - Branches over 2 1/2" diameter

Does compost need to be turned?

No. Turning speeds up decomposition but is not necessary to produce compost.

How can unfinished compost be reheated?

Relatively fresh materials will heat up if turned (with proper moisture and bruising or shredding). Older "brown" materials can be reheated by adding a high nitrogen fertilizer, green grass clippings or manure when they are turned. Pouring liquid nitrogen on a pile will also heat it up.

10. Additives: Lime, soil, "starters", fertilizer.

Should limestone be added to compost?

"To lime or not to lime, that is the question" and a very disputed question it is!

Lime is called for only when you wish to lower the acidity of your soil or your compost. Test your soil's pH level; only if you are sure that it is too acid is it appropriate to add lime to your compost. If your heap happens to be composed solely of highly acidic materials such as oak leaves, pine needles, chestnut leaves or pine sawdust, it might also be o.k. to sprinkle on some lime.

Remember that most finished compost from your yard waste has a neutral to slightly alkaline pH, and a significant ability to buffer against acidity in soil.

In general, there is no need to add lime to your compost pile, and adding lime can contribute to loss of nitrogen through smelly ammonia gases.

Should compost "starters" or soil be added to compost piles?

Starters are not essential for composting. Most "starters" are nitrogen fertilizers and/or dehydrated bacteria. Bacteria are already present on dead plant material and multiply rapidly. If a nitrogen source is needed, fertilizers are cheaper than "starters". Soil is not needed in a compost pile, but there are advantages to using it, as it introduces soil organisms into the pile and controls odours.

Do you need to add fertilizer to the compost pile?

This depends on the material being composted. A mix of typical yard wastes (leaves, grass clippings, weeds etc.) contains sufficient nitrogen for decomposition. Nitrogen fertilizers may be added to speed decomposition of carbonaceous matter such as twigs, straw or wood chips. Addition of rock phosphate or other high phosphorous fertilizer will benefit compost by reacting with other nutrients, making them more available to plants, and adding much-needed phosphorous to our soils.

"Special" wastes.

11. "Special" Yard Wastes

Can grass clippings be composted without becoming matted and smelly?

Grass clippings mat and are smelly because their fine texture excludes air from piles, while their high nitrogen content creates quick composting, which demands a lot of air. Very soon the air in the pile runs out, and anaerobic bacteria that emit a rotten egg smell take over. Mixing grass with materials that are coarser and contain more carbon, such as brown leaves or straw, will eliminate odours and speed up decomposition. Alternatively, grass clippings may be spread as a mulch in the garden, or left to lie on the lawn. Compost piles made entirely of grass clippings will break down just fine if left undisturbed long enough.

Can waxy, evergreen yard wastes like laurel leaves be composted? Rose prunings? Pine needles? Holly leaves? Rhododendron leaves? Laurel leaves, rose prunings, pine needles, holly, rhododendron and other waxy leaves break down more slowly than many other garden wastes, but they do not pose any problem in the compost or in the garden (except for rose thorns which may attack you). Shredding these materials will help to break them down more quickly and be less visible in the finished compost. Their texture and resistance to decomposition makes them excellent for mulching to protect tender plants from frost.

Can sod be composted without continually resprouting?

Yes. Sod should be composted in piles covered with black plastic to exclude light and stop all growth. Other materials may be added to the pile, including vegetatively spreading weeds such as buttercup and quack grass which will also die without light. (Morning Glory will not be killed this way.)

12. Food waste composting: Worm bins, coffee filters, etc.

Can you compost if you just have kitchen wastes and no yard wastes?

Kitchen wastes - without meat or fish scraps, dairy products or oily foods - can be composted in worm bins or buried at least 8" deep around shrubs and trees or in fallow areas of the garden. You can compost in a regular compost bin, too, but be sure to thoroughly cover each deposit of food waste with soil.

Why can't dairy products, meat or fish scraps be composted?
Animal products attract flies, rodents and other pests which create nuisances and carry disease. These animal wastes are also more likely to create odour problems and other complications.

Can coffee filters and tea bags be composted?

Yes. Any uncoated paper product may be composted. Don't try to compost coated papers such as glossy magazines or photographs, waxed paper and treated copy paper. (see Section 5, "Can glossy magazines, colour inserts...")

If I compost coffee grounds from a restaurant, do I have to add limestone to combat the acidity?

Once water has passed through the coffee grounds, there is mostly fibre left. Most of the acid would be in the water. If you wish, you can do a soil test on your garden every couple of years to see what effect your compost is having on the soil. You can get a kit from the Ontario Ministry of Agriculture and Food.

(Mary Perlmutter) Soil testing in Massachusetts is provided by the Univ. of Mass. Amherst Soil Testing Lab. See attached instruction sheet.

How can kitchen wastes be kept from smelling bad while storing them for composting?

Store food wastes in buckets with tight-fitting lids until ready to add to the compost bin. Keep a large (5 gallon) bucket outside and a small (1/2 gallon to 1 gallon) container inside which can be emptied into the larger outdoor container daily. If you wish to keep the 5 gallon container indoors, have a supply of sawdust on hand nearby, then cover each deposit of food waste with a layer of sawdust. The sawdust absorbs odors and moisture, and reports indicate that food waste can be stored this way for up to a week.

Another storage method that has worked, is storing compostables in the freezer until ready to take to the bin.

Are bugs in my worm box OK? How can I get rid of fruit flies? Many bugs may be at work in the worm box helping the worms to decompose organic wastes - sow bugs, spiders, centipedes and slugs are all common. Most of them are not a problem. Fruit flies may present a problem though. Try covering bedding with plastic or sections of newspaper overlapped to create a barrier. Make sure you have a tight-fitting lid on the box to exclude flies. There are also certain types of nematodes which can be added to worm bins to eat fly maggots but not disturb the worms. (These nematodes are available at the Natural Gardening Research Centre, for around \$5.00. Write N.G.R.C. at Highway 48, P.O. Box 149, Sunman, Indiana, USA 47041; telephone 812-623-3800)

13. I run a campground for 100 families and would like to set up a composting system. What type of container should I use and how big should it be?

Interest in composting at camps, campgrounds, housing co-ops etc. is quite recent, so this question is breaking new ground. You can describe the experience at the Hugh Gardener Co-op. as well as the experience at Camp Allsaw. The following information is from Mr. Sam Hambly, who runs Camp Allsaw and does worm composting year-around in an insulated bin.

- the camp has 110-125 people and produces 8-9 gallons of food waste/day
- they made a container from a roll of heavy-duty construction wire with 6" squares; it is 8' in diameter
- the barbs at the top keep the bears away but do not deter racoons; he plans to put on a cover
- he composts horse manure, grass clippings, hay, weeds from the garden and the food waste from the camp
- aeration is provided by a series of 4" drainage pipes
- Mr. Hambly says it's OK to give people his phone number if they would like to talk to him directly; it's 249-4517

LEAF AND YARD WASTE COMPOST TESTING

Testing leaf and yard waste compost for safety and quality may be necessary depending on the source of the composted material and the intended end use. DEP recommends lead testing for compost that is derived from leaves swept or vacuumed off the streets (unless it is to be used for landfill cover or roadside projects). Compost that is to be sold or made available to the public should be tested for lead as well as nutrient levels, pH, and the presence of substances that can be toxic to plants. These are the minimum testing recommendations. There are several other tests you may find useful in establishing the quality of your compost.

Two organizations that offer compost testing services are the University of Massachusetts Cooperative Extension Soil Testing Lab in Amherst, and Woods End Research Lab in Mt. Vernon, Maine. Their services and fees are described below, and by providing them, the Massachusetts Department of Environmental Protection is not recommending them over any others.

1. The University of Massachusetts Soil Testing Lab provides basic soil testing, which is also applicable to compost.

Tests and fees: pH only - \$2.00
pH, nitrogen, phosphorus, potassium, lead, arsenic
and aluminum - \$7.00
Complete nutrient analysis plus organic matter
content - \$10.00

Procedure:

1. Take a composite sample of material to be tested. (To get a composite sample, mix 5-10 samples from different parts of the finished compost pile in a bucket and remove one cupful).
2. Put in a ziploc bag (if sample is excessively wet, dry at room temperature for a day or two first).
3. Identify sample (compost or soil) and what crop is to be grown in it, if applicable. If more than one sample is sent, be sure each is properly identified.
4. Indicate which tests are to be performed, including address where results should be sent.
5. Enclose check payable to: University of Massachusetts
6. Send check and sample(s) to:

Soil Testing Lab
West Experiment Station
N. Pleasant Street
University of Massachusetts
Amherst, MA 01003

(413) 545-2311

II. Woods End Research Lab in Mt. Vernon, Maine, specializes in compost testing and research. The services they offer are highly sophisticated and are useful for specific needs, such as determining how a sample will affect plant growth. In addition to nutrient and metals testing, Woods End offers tests for stability, phytotoxicity, disease suppression, and odor causing substances.

Tests and fees: **STANDARD ANALYSIS** - \$100.00; includes pH, organic matter content, salinity, oxidation-reduction potential, density, percent moisture content, and carbon-nitrogen ratio.

MINERAL ANALYSIS - \$50.00; includes sodium, potassium, magnesium, calcium, and phosphorus content.

METAL ANALYSIS - \$150.00; includes the heavy metals lead, cadmium, chromium, nickel, iron, copper, zinc and manganese content.

SOLUBLE NITROGEN ANALYSIS - \$35.00; includes chloride, nitrite, nitrate and ammonium content.

CARBON DIOXIDE AND AMMONIA - \$67.00; includes CO₂ and NH₃ evolution rate.

COMPLETE ANALYSIS - \$325.00; includes standard, mineral, metal, soluble nitrogen, and carbon dioxide and ammonia analysis.

VOLATILE ORGANIC ACIDS - \$75.00; tests for anaerobic acids.

PHYTOTOXICITY - \$250.00; gross bioassay which determines presence or lack of growth reducing factors which may be present in compost sample.

FATS & OILS - \$115.00; total extractible fat, oil and grease (odor causing substances).

BENCH SCALE COMPOSTING - Variable cost; computerized adiabatic composting simulator to measure biodegradation potential of waste materials.

Procedure:

1. Take a composite sample of material to be tested. (To get a composite sample, mix 5-10 samples from different parts of the finished compost pile in a bucket and remove one cupful).
2. Put in a ziploc bag or airtight container.
3. Enclose correspondence indicating desired testing and current mailing address for billing and receipt of lab results.
4. Send sample and instructions to:

Woods End Research Laboratory
Rome Road, Box 1850
Mt. Vernon, ME 04352
(207) 293-2457
FAX (207) 293-2488

HOME COMPOSTING BIBLIOGRAPHY

1. Let It Rot! The Home Gardener's Guide to Composting by Stu Campbell. Storey Communications Inc., Vermont, 1975. 152 pp. A readable and thorough guide to backyard composting. Covers materials, containers, how to compost, soil organisms and how to use finished compost.
2. The Rodale Guide to Composting by Jerry Minnich, Marjorie Hunt and the editors of Organic Gardening magazine. Rodale Press, Emmaus, PA, 1979. 405 pp. This comprehensive text can serve as a useful reference tool. Contains numerous photographs and illustrations.
3. Worms Eat My Garbage by Mary Appelhof. Flower Press, Michigan, 1982. 100 pp. Filled with humorous drawings, this easy-to-read book gives you all the information you need to compost food waste with worms. It covers worm bins and beddings, what to feed the worms, how to care for them, and how to use the finished compost.
4. How to Get Your Lawn and Garden Off Drugs, Pesticide-Free Gardening for a Healthier Environment by Carole Rubin, Friends of the Earth, 701-251 Laurier Ave. W., Ottawa, Ontario K1P 5J6. A guide to looking after our lawns and gardens without the use of chemical pesticides and fertilizers. If you garden the organic way you can avoid the dilemma of whether or not to compost yard waste treated with chemicals. Can be ordered from Friends of the Earth for \$9.95 a copy plus \$2.00 shipping and handling (prepayment required), or check your local bookstores.
5. "The Wild World of Compost" appeared in National Geographic August 1980. This article describes the organisms of the compost pile that transform organic wastes into rich humus. Check your local library, or you can buy a copy of the magazine for \$2.65 + \$1.20 for postage (U.S.) from National Geographic Society, 17th & M Streets N.W., Washington, D.C. 20036.
6. Easy Composting, by Vic Sussman, Rodale Press, Emmaus, PA, 1982. This book as an excellent guide for beginners.
7. How to Grow More Vegetables, by J. Jeavons, 10 Speed Press, Berkeley, CA, 1979, (159 pages). This book has a clear and well illustrated section with a recipe for composting.
8. The Self Sufficient Gardener, by John Seymour, Dolphin Books, Doubleday and Co., New York, NY, 1980, (256 pages). This guide deals not only with composting, but also includes growing, preparing and preserving home-grown produce.

